Full wwPDB X-ray Structure Validation Report

Sep 2, 2025 – 01:05 PM EDT

PDB ID	:	9Q4J / pdb_00009q4j
Title	:	Structure of human neuronal nitric oxide synthase R354A/G357D mutant heme domain bound with 6-((5-(2-(azetidin-1-yl)ethyl)-2,3-difluorophenoxy)methyl)-4-methylpyridin-2-amine
Authors	:	Li, H.; Poulos, T.L.
Deposited on	:	2025-08-20
Resolution	:	2.20 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

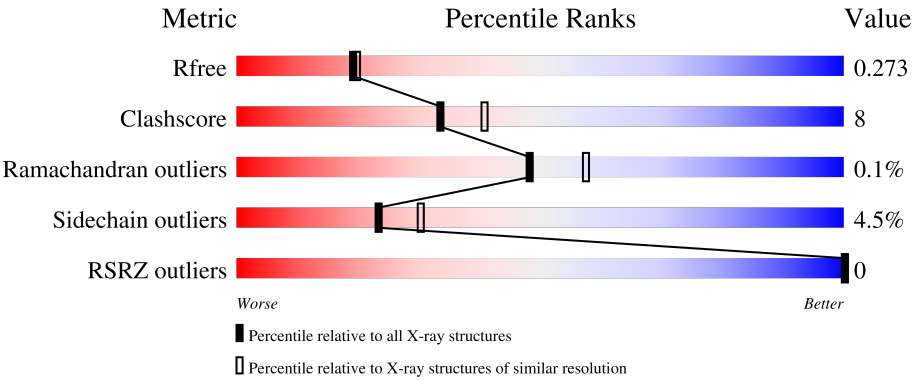
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.20 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	5791 (2.20-2.20)
Clashscore	180529	6634 (2.20-2.20)
Ramachandran outliers	177936	6560 (2.20-2.20)
Sidechain outliers	177891	6561 (2.20-2.20)
RSRZ outliers	164620	5791 (2.20-2.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	423	80% 18%
1	B	423	78% 18%
1	C	423	77% 19%
1	D	423	79% 19%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 14355 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

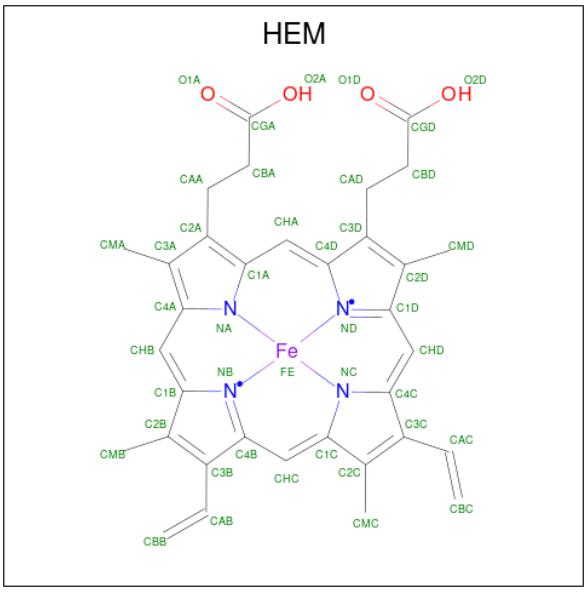
- Molecule 1 is a protein called Nitric oxide synthase, brain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	418	Total	C	N	O	S	0	5	0
			3424	2191	585	626	22			
1	B	414	Total	C	N	O	S	0	2	0
			3379	2165	575	618	21			
1	C	412	Total	C	N	O	S	0	5	0
			3377	2166	574	616	21			
1	D	418	Total	C	N	O	S	0	3	0
			3420	2188	585	626	21			

There are 16 discrepancies between the modelled and reference sequences:

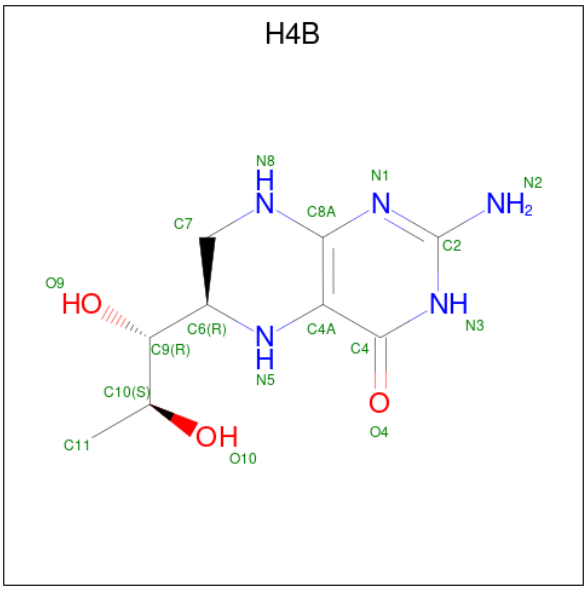
Chain	Residue	Modelled	Actual	Comment	Reference
A	354	ALA	ARG	engineered mutation	UNP P29475
A	357	ASP	GLY	engineered mutation	UNP P29475
A	723	LEU	-	expression tag	UNP P29475
A	724	VAL	-	expression tag	UNP P29475
B	354	ALA	ARG	engineered mutation	UNP P29475
B	357	ASP	GLY	engineered mutation	UNP P29475
B	723	LEU	-	expression tag	UNP P29475
B	724	VAL	-	expression tag	UNP P29475
C	354	ALA	ARG	engineered mutation	UNP P29475
C	357	ASP	GLY	engineered mutation	UNP P29475
C	723	LEU	-	expression tag	UNP P29475
C	724	VAL	-	expression tag	UNP P29475
D	354	ALA	ARG	engineered mutation	UNP P29475
D	357	ASP	GLY	engineered mutation	UNP P29475
D	723	LEU	-	expression tag	UNP P29475
D	724	VAL	-	expression tag	UNP P29475

- Molecule 2 is PROTOPORPHYRIN IX CONTAINING FE (CCD ID: HEM) (formula: $C_{34}H_{32}FeN_4O_4$).



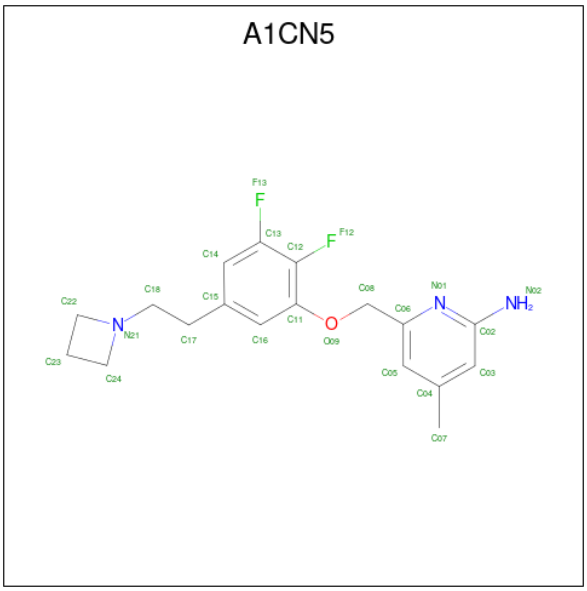
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	B	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	C	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		
2	D	1	Total	C	Fe	N	O	0	0
			43	34	1	4	4		

- Molecule 3 is 5,6,7,8-TETRAHYDROBIOPTERIN (CCD ID: H4B) (formula: $C_9H_{15}N_5O_3$).



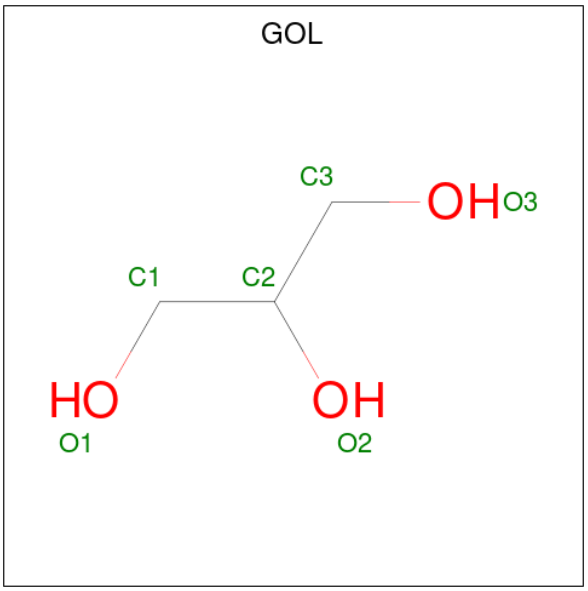
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	A	1	Total	C	N	O	0	0
			17	9	5	3		
3	A	1	Total	C	N	O	0	0
			17	9	5	3		
3	C	1	Total	C	N	O	0	0
			17	9	5	3		
3	C	1	Total	C	N	O	0	0
			17	9	5	3		

- Molecule 4 is 6-({5-[2-(azetidin-1-yl)ethyl]-2,3-difluorophenoxy}methyl)-4-methylpyridin-2-amine (CCD ID: A1CN5) (formula: $C_{18}H_{21}F_2N_3O$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
4	A	1	Total	C	F	N	O	0	0
			24	18	2	3	1		
4	B	1	Total	C	F	N	O	0	0
			24	18	2	3	1		
4	C	1	Total	C	F	N	O	0	0
			24	18	2	3	1		
4	D	1	Total	C	F	N	O	0	0
			24	18	2	3	1		

- Molecule 5 is GLYCEROL (CCD ID: GOL) (formula: $C_3H_8O_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C O 6 3 3	0	0
5	A	1	Total C O 6 3 3	0	0
5	B	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	C	1	Total C O 6 3 3	0	0
5	D	1	Total C O 6 3 3	0	0

- Molecule 6 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	1	Total Zn 1 1	0	0
6	D	1	Total Zn 1 1	0	0

- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	87	Total O 87 87	0	0

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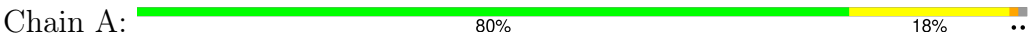
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	B	108	Total O 108 108	0	0
7	C	101	Total O 101 101	0	0
7	D	85	Total O 85 85	0	0

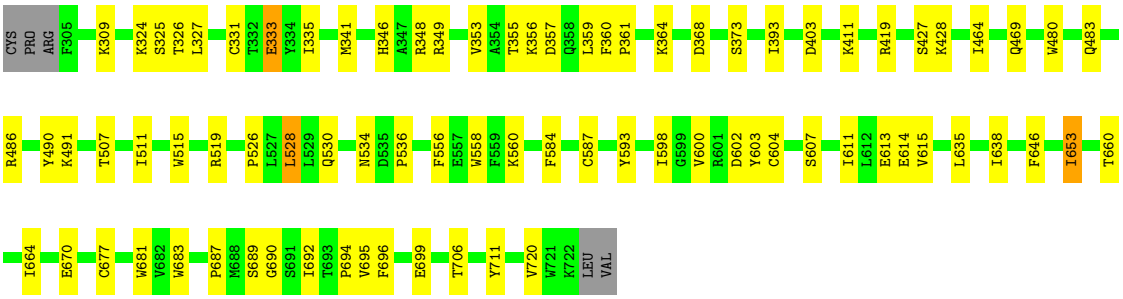
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Nitric oxide synthase, brain

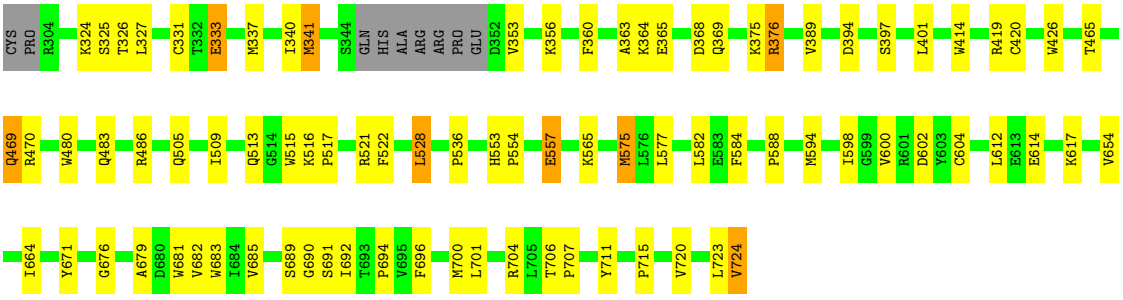
Chain A:





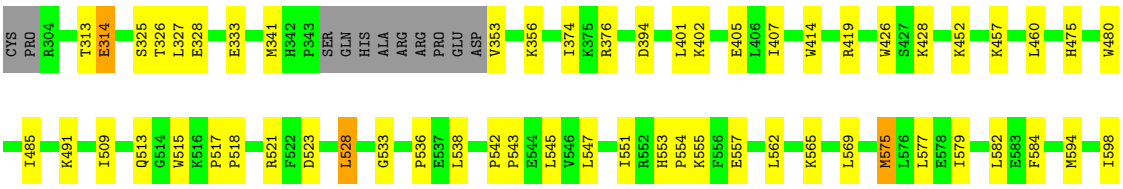
• Molecule 1: Nitric oxide synthase, brain

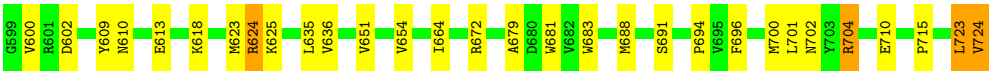
Chain B:



• Molecule 1: Nitric oxide synthase, brain

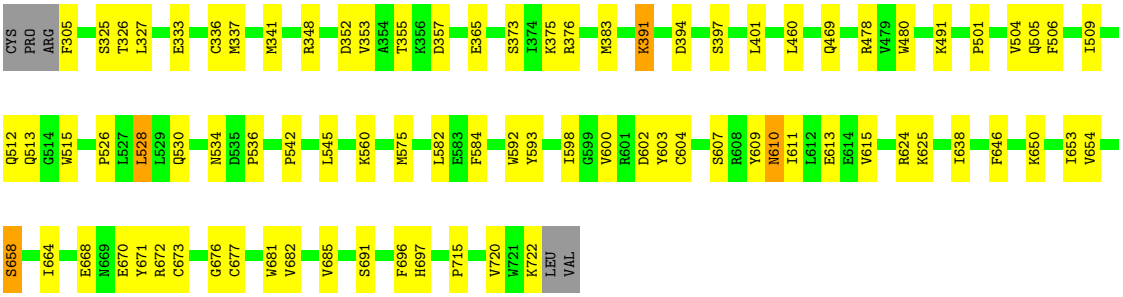
Chain C:





• Molecule 1: Nitric oxide synthase, brain

Chain D:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	51.91Å 118.61Å 164.14Å 90.00° 90.06° 90.00°	Depositor
Resolution (Å)	49.48 – 2.20 49.48 – 2.20	Depositor EDS
% Data completeness (in resolution range)	98.7 (49.48-2.20) 98.7 (49.48-2.20)	Depositor EDS
R_{merge}	0.18	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.15 (at 2.20Å)	Xtriage
Refinement program	PHENIX (1.11.1_2575: ???)	Depositor
R, R_{free}	0.207 , 0.273 0.204 , 0.273	Depositor DCC
R_{free} test set	5005 reflections (2.58%)	wwPDB-VP
Wilson B-factor (Å^2)	39.4	Xtriage
Anisotropy	1.005	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.33 , 30.2	EDS
L-test for twinning[2]	$< \|L\| > = 0.51$, $< L^2 > = 0.35$	Xtriage
Estimated twinning fraction	0.469 for h,-k,-l	Xtriage
F_o,F_c correlation	0.97	EDS
Total number of atoms	14355	wwPDB-VP
Average B, all atoms (Å^2)	58.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.11% of the height of the origin peak. No significant pseudotranslation is detected.*

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: H4B, GOL, A1CN5, HEM, ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.33	0/3537	0.51	0/4802
1	B	0.35	0/3480	0.52	0/4721
1	C	0.34	0/3487	0.52	0/4732
1	D	0.32	0/3527	0.52	0/4787
All	All	0.33	0/14031	0.52	0/19042

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3424	0	3339	50	0
1	B	3379	0	3295	55	0
1	C	3377	0	3304	58	0
1	D	3420	0	3328	50	0
2	A	43	0	30	5	0
2	B	43	0	30	4	0
2	C	43	0	30	4	0
2	D	43	0	30	2	0
3	A	34	0	30	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	34	0	30	1	0
4	A	24	0	0	0	0
4	B	24	0	0	0	0
4	C	24	0	0	1	0
4	D	24	0	0	1	0
5	A	12	0	16	2	0
5	B	6	0	8	0	0
5	C	12	0	16	1	0
5	D	6	0	8	0	0
6	A	1	0	0	0	0
6	D	1	0	0	0	0
7	A	87	0	0	4	0
7	B	108	0	0	1	0
7	C	101	0	0	6	0
7	D	85	0	0	3	0
All	All	14355	0	13494	208	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (208) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:610:ASN:ND2	7:D:901:HOH:O	2.09	0.84
1:D:528:LEU:HD22	1:D:536:PRO:HB2	1.61	0.80
1:C:624:ARG:NH1	7:C:901:HOH:O	2.15	0.79
1:B:528:LEU:HD22	1:B:536:PRO:HB2	1.64	0.79
1:C:704:ARG:HH11	1:C:704:ARG:HB3	1.47	0.78
2:D:802:HEM:HBB2	2:D:802:HEM:HHC	1.67	0.76
1:B:521:ARG:NH1	7:B:901:HOH:O	2.19	0.76
1:C:704:ARG:NH2	1:C:710:GLU:OE2	2.17	0.76
2:A:801:HEM:HHC	2:A:801:HEM:HBB2	1.67	0.75
1:A:528:LEU:HD22	1:A:536:PRO:HB2	1.72	0.71
2:A:801:HEM:HBC2	2:A:801:HEM:HMC2	1.73	0.71
1:B:480:TRP:HB2	1:B:528:LEU:HB3	1.74	0.70
1:B:419:ARG:HB2	2:B:801:HEM:HBD2	1.72	0.70
1:C:598:ILE:HA	1:C:602:ASP:HB2	1.73	0.69
1:C:704:ARG:HB3	1:C:704:ARG:NH1	2.07	0.69
2:D:802:HEM:HMC2	2:D:802:HEM:HBC2	1.73	0.69
1:C:528:LEU:HD22	1:C:536:PRO:HB2	1.73	0.69
1:D:480:TRP:HB2	1:D:528:LEU:HB3	1.73	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:801:HEM:HHC	2:B:801:HEM:HBB2	1.76	0.67
1:D:327:LEU:HD21	1:D:348:ARG:HG3	1.77	0.67
1:A:419:ARG:HB2	2:A:801:HEM:HAD1	1.76	0.67
1:C:613:GLU:HG3	1:C:623:MET:HE1	1.78	0.65
1:B:679:ALA:HB3	1:B:700:MET:HB3	1.80	0.64
1:D:664:ILE:O	1:D:668[B]:GLU:HG2	1.98	0.63
2:C:801:HEM:HHC	2:C:801:HEM:HBB2	1.81	0.62
1:C:327:LEU:HB3	1:C:704:ARG:NH1	2.14	0.62
1:C:480:TRP:HB2	1:C:528:LEU:HB3	1.80	0.62
1:A:635:LEU:HD22	1:B:692:ILE:HD13	1.83	0.60
1:B:364:LYS:NZ	1:B:368:ASP:OD2	2.31	0.60
2:C:801:HEM:HMC2	2:C:801:HEM:HBC2	1.83	0.60
1:A:346:HIS:HE2	1:D:376:ARG:HA	1.65	0.59
1:C:341:MET:HE2	3:C:802:H4B:H9	1.83	0.59
1:A:327:LEU:HD11	1:A:348:ARG:HG3	1.85	0.59
1:A:483:GLN:NE2	7:A:904:HOH:O	2.35	0.58
1:A:355:THR:OG1	1:A:357:ASP:OD2	2.23	0.57
1:A:480:TRP:HB2	1:A:528:LEU:HB3	1.86	0.56
1:C:679:ALA:HB3	1:C:700:MET:HB3	1.87	0.56
1:D:671:TYR:CE2	1:D:676:GLY:HA2	2.41	0.56
1:A:356:LYS:NZ	1:D:672:ARG:O	2.38	0.56
1:A:530:GLN:HG3	1:A:534:ASN:O	2.06	0.56
1:C:723:LEU:HD23	1:C:724:VAL:H	1.71	0.56
1:A:355:THR:HG21	5:A:807:GOL:H32	1.89	0.55
2:C:801:HEM:HBD2	7:C:962:HOH:O	2.05	0.55
1:C:327:LEU:HG	1:C:328:GLU:N	2.23	0.54
1:B:337:MET:HB3	1:B:340:ILE:HG13	1.90	0.54
1:D:600:VAL:O	1:D:604:CYS:HB2	2.08	0.54
1:B:575:MET:HE1	1:B:711:TYR:CD2	2.44	0.53
1:C:600:VAL:HG22	1:C:635:LEU:HD11	1.90	0.53
1:C:515:TRP:CZ3	1:C:517:PRO:HB3	2.43	0.53
1:A:687:PRO:HB2	1:B:691:SER:HB3	1.89	0.53
1:A:600:VAL:O	1:A:604:CYS:HB2	2.09	0.53
1:D:391:LYS:HA	1:D:394:ASP:HB2	1.91	0.53
1:C:681:TRP:CZ3	1:D:682:VAL:HG13	2.44	0.53
1:A:403:ASP:HB2	7:A:966:HOH:O	2.10	0.52
1:D:506:PHE:HA	1:D:509:ILE:HD12	1.91	0.52
1:B:483:GLN:HB2	1:B:486:ARG:HG3	1.92	0.52
1:C:327:LEU:HG	1:C:328:GLU:H	1.75	0.52
1:D:515:TRP:CE2	1:D:526:PRO:HD3	2.45	0.52
1:C:475:HIS:HA	1:C:533:GLY:HA3	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:598:ILE:O	1:B:602:ASP:HB2	2.10	0.51
1:B:689:SER:HB3	1:B:692:ILE:HD11	1.91	0.51
1:B:706:THR:HA	1:B:707:PRO:C	2.35	0.51
1:C:518:PRO:HG2	1:C:523:ASP:CG	2.35	0.51
1:C:577:LEU:HB3	1:C:584:PHE:HB2	1.92	0.51
1:B:414:TRP:CE3	1:B:426:TRP:HA	2.46	0.51
1:B:356:LYS:HE2	1:B:397:SER:OG	2.10	0.51
1:A:333:GLU:HA	1:B:331:CYS:O	2.11	0.50
1:D:530:GLN:HG3	1:D:534:ASN:O	2.11	0.50
1:A:646:PHE:CG	1:A:653:ILE:HD12	2.47	0.50
1:D:691:SER:HA	1:D:696:PHE:CG	2.47	0.50
1:A:359:LEU:HD23	1:A:393:ILE:HG12	1.93	0.50
1:B:353:VAL:HG11	1:B:470:ARG:HD3	1.92	0.50
1:C:402:LYS:HB2	1:C:405:GLU:HG3	1.94	0.49
1:A:469:GLN:HB3	1:A:584:PHE:CE2	2.48	0.49
1:C:313:THR:C	1:C:314:GLU:HG2	2.36	0.49
1:A:711:TYR:OH	2:A:801:HEM:O1D	2.26	0.49
1:A:593:TYR:CD1	1:A:598:ILE:HD11	2.48	0.49
1:A:364:LYS:NZ	1:A:368:ASP:OD2	2.46	0.49
1:A:613:GLU:HB2	7:A:934:HOH:O	2.13	0.49
1:A:681:TRP:CZ3	1:B:682:VAL:HG13	2.47	0.49
1:C:480:TRP:CE2	1:C:715:PRO:HB2	2.47	0.48
1:D:505:GLN:O	1:D:509:ILE:HG13	2.12	0.48
1:D:646:PHE:CG	1:D:653:ILE:HD12	2.49	0.48
1:C:521:ARG:NH1	7:C:906:HOH:O	2.39	0.48
1:C:702:ASN:HB3	1:D:336:CYS:HB3	1.95	0.48
1:A:603:TYR:HB3	1:A:611:ILE:HG12	1.94	0.48
1:D:593:TYR:CD1	1:D:598:ILE:HD11	2.48	0.48
1:A:690:GLY:O	1:A:696:PHE:HB2	2.13	0.48
1:B:557:GLU:N	1:B:557:GLU:OE1	2.46	0.48
1:C:521:ARG:HE	1:C:609:TYR:HE2	1.60	0.48
1:A:464:ILE:HD11	1:A:587:CYS:HB2	1.96	0.47
1:D:691:SER:O	1:D:697:HIS:NE2	2.35	0.47
1:C:414:TRP:CE3	1:C:426:TRP:HA	2.49	0.47
1:C:664:ILE:HG13	1:C:694:PRO:HB2	1.96	0.47
1:D:542:PRO:HD2	1:D:545:LEU:HD12	1.95	0.47
1:C:562:LEU:HD21	1:C:618:LYS:HD2	1.96	0.47
1:A:664:ILE:HG13	1:A:694:PRO:HB2	1.96	0.47
1:B:469:GLN:HB3	1:B:584:PHE:CE2	2.50	0.47
1:C:594:MET:HA	1:C:654:VAL:O	2.15	0.47
1:C:509:ILE:O	1:C:513:GLN:HG2	2.15	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:671:TYR:CD2	1:D:676:GLY:HA2	2.50	0.47
1:D:670:GLU:CB	1:D:677:CYS:HB2	2.45	0.47
1:D:603:TYR:HA	1:D:609:TYR:HB2	1.97	0.46
1:D:681:TRP:CZ2	1:D:685:VAL:HG21	2.49	0.46
1:C:452:LYS:HB2	1:C:545:LEU:HD22	1.96	0.46
1:C:691:SER:HA	1:C:696:PHE:CG	2.50	0.46
1:C:356:LYS:NZ	1:C:394:ASP:O	2.45	0.46
1:C:551:ILE:HG12	1:C:565:LYS:HA	1.98	0.46
1:D:575:MET:SD	4:D:803:A1CN5:F13	2.64	0.46
1:A:515:TRP:CE2	1:A:526:PRO:HD3	2.51	0.46
1:B:509:ILE:O	1:B:513:GLN:HG2	2.15	0.46
1:A:670:GLU:CB	1:A:677:CYS:HB2	2.46	0.46
1:D:509:ILE:O	1:D:513:GLN:HG2	2.16	0.46
1:D:654:VAL:HG23	1:D:658:SER:HB3	1.97	0.45
1:D:613:GLU:HB2	7:D:901:HOH:O	2.14	0.45
1:C:624:ARG:NH2	7:C:911:HOH:O	2.49	0.45
1:D:670:GLU:HB2	1:D:677:CYS:HB2	1.98	0.45
1:A:357:ASP:HB3	1:D:673:CYS:O	2.17	0.45
1:C:521:ARG:HH21	1:C:609:TYR:HD2	1.64	0.45
1:B:521:ARG:HG2	1:B:522:PHE:CE1	2.51	0.45
1:B:600:VAL:O	1:B:604:CYS:HB2	2.16	0.45
1:D:609:TYR:HB3	1:D:611:ILE:HG23	1.98	0.45
1:B:614:GLU:HA	1:B:617:LYS:HE3	1.98	0.45
1:D:478:ARG:NH2	1:D:715:PRO:HD3	2.32	0.45
1:B:598:ILE:HA	1:B:602:ASP:HB2	1.99	0.45
1:B:664:ILE:HG13	1:B:694:PRO:HB2	1.98	0.45
1:B:528:LEU:HD23	1:B:528:LEU:HA	1.84	0.45
1:B:681:TRP:CZ2	1:B:685:VAL:HG21	2.52	0.45
1:A:528:LEU:HD23	1:A:528:LEU:HA	1.80	0.44
1:B:327:LEU:HD12	1:B:704:ARG:HG2	1.99	0.44
1:A:556:PHE:HB3	1:A:558:TRP:CE2	2.52	0.44
1:C:542:PRO:HD2	1:C:545:LEU:HD12	1.99	0.44
1:C:636:VAL:HG22	1:C:688:MET:HE1	1.99	0.44
1:D:469:GLN:HB3	1:D:584:PHE:CE2	2.52	0.44
1:D:528:LEU:HD23	1:D:528:LEU:HA	1.85	0.44
1:D:598:ILE:O	1:D:602:ASP:HB2	2.18	0.44
1:D:624:ARG:HG2	1:D:625:LYS:HG3	1.98	0.44
1:A:331:CYS:O	1:B:333:GLU:HA	2.18	0.44
1:A:507:THR:O	1:A:511:ILE:HG13	2.18	0.44
1:C:683:TRP:CZ3	2:C:801:HEM:HBA2	2.52	0.44
1:D:603:TYR:HB3	1:D:611:ILE:HG12	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:460:LEU:HD13	1:C:569:LEU:HD12	2.00	0.44
1:D:355:THR:OG1	1:D:357:ASP:OD2	2.30	0.44
1:A:360:PHE:HB3	1:A:361:PRO:HD3	1.99	0.44
1:B:691:SER:HA	1:B:696:PHE:CG	2.52	0.44
1:C:542:PRO:HA	1:C:543:PRO:HD3	1.91	0.44
1:C:547:LEU:HD21	1:C:651:VAL:HG22	1.99	0.44
1:A:689:SER:HB3	1:A:692:ILE:HG12	2.00	0.44
1:B:594:MET:HA	1:B:654:VAL:O	2.18	0.44
1:B:690:GLY:O	1:B:696:PHE:HB2	2.17	0.44
1:D:460:LEU:HD12	1:D:592:TRP:HB3	2.00	0.44
1:D:501:PRO:HA	1:D:504:VAL:HG23	1.99	0.43
1:B:341:MET:HE2	1:B:341:MET:HB2	1.73	0.43
1:B:483:GLN:HB2	1:B:486:ARG:CG	2.48	0.43
1:D:348:ARG:NH1	1:D:365:GLU:OE2	2.47	0.43
1:B:419:ARG:HD3	1:B:683:TRP:CD2	2.53	0.43
1:B:360:PHE:HZ	1:B:394:ASP:OD1	2.01	0.43
1:C:374:ILE:O	1:C:376:ARG:HG2	2.18	0.43
1:A:335:ILE:HD11	1:B:701:LEU:HD22	2.01	0.43
1:B:353:VAL:HG11	1:B:470:ARG:CD	2.48	0.43
1:B:375:LYS:O	1:B:376:ARG:HD3	2.18	0.43
1:A:683:TRP:CZ3	2:A:801:HEM:HBA2	2.54	0.42
1:A:411:LYS:HE3	5:A:804:GOL:H2	2.01	0.42
1:A:428:LYS:HE2	1:A:428:LYS:HB3	1.83	0.42
1:C:575:MET:SD	4:C:803:A1CN5:F13	2.68	0.42
1:A:483:GLN:HB2	1:A:486:ARG:HG2	2.01	0.42
1:A:598:ILE:O	1:A:602:ASP:HB2	2.19	0.42
1:B:515:TRP:CZ3	1:B:517:PRO:HB3	2.55	0.42
2:B:801:HEM:HMC1	2:B:801:HEM:HBC2	2.02	0.42
1:C:577:LEU:HD21	1:C:579:ILE:HD11	2.01	0.42
1:D:327:LEU:HD11	1:D:348:ARG:HD2	2.01	0.42
1:C:328:GLU:HA	1:D:333:GLU:O	2.20	0.42
1:A:309:LYS:O	1:A:699:GLU:HG3	2.19	0.42
1:A:611:ILE:HA	7:A:974:HOH:O	2.20	0.42
1:A:615:VAL:HG21	1:A:638:ILE:HD11	2.02	0.42
1:A:600:VAL:HG22	1:A:635:LEU:HD11	2.01	0.42
1:B:553:HIS:CG	1:B:554:PRO:HD2	2.55	0.42
1:C:701:LEU:HD21	1:D:337:MET:HE2	2.02	0.42
1:D:401:LEU:HG	1:D:582:LEU:HD12	2.01	0.42
1:C:528:LEU:HD23	1:C:528:LEU:HA	1.93	0.41
1:C:625:LYS:HD3	7:C:901:HOH:O	2.20	0.41
1:D:615:VAL:HG21	1:D:638:ILE:HD11	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:420:CYS:HB2	2:B:801:HEM:ND	2.34	0.41
1:B:671:TYR:CE2	1:B:676:GLY:HA2	2.55	0.41
1:B:363:ALA:HB1	1:B:389:VAL:HG11	2.02	0.41
1:B:480:TRP:CE2	1:B:715:PRO:HB2	2.55	0.41
1:B:577:LEU:HB3	1:B:584:PHE:HB2	2.01	0.41
1:C:610:ASN:O	7:C:902:HOH:O	2.21	0.41
1:A:687:PRO:CB	1:B:691:SER:HB3	2.51	0.41
1:B:327:LEU:HB2	1:B:704:ARG:HB3	2.02	0.41
1:B:522:PHE:HB2	1:B:565:LYS:HE3	2.02	0.41
1:A:660:THR:HB	1:A:695:VAL:HG13	2.03	0.41
1:B:401:LEU:HG	1:B:582:LEU:HD12	2.02	0.41
1:C:401:LEU:HG	1:C:582:LEU:HD12	2.02	0.41
1:C:407:ILE:HD13	5:C:805:GOL:H31	2.02	0.41
1:C:419:ARG:HD3	1:C:683:TRP:CD2	2.56	0.41
1:C:701:LEU:HD23	1:C:701:LEU:HA	1.83	0.41
1:D:333:GLU:OE1	1:D:333:GLU:N	2.50	0.41
1:A:490:TYR:CE1	1:A:519:ARG:HA	2.56	0.41
1:D:352:ASP:HB3	1:D:353:VAL:H	1.62	0.41
1:B:465:THR:O	1:B:588:PRO:HD2	2.21	0.41
1:B:723:LEU:HD12	1:B:724:VAL:H	1.86	0.41
1:A:341:MET:HE2	1:A:341:MET:HB2	1.98	0.40
1:B:612:LEU:HD23	1:B:612:LEU:HA	1.95	0.40
1:D:611:ILE:HA	7:D:949:HOH:O	2.20	0.40
1:C:553:HIS:CG	1:C:554:PRO:HD2	2.56	0.40
1:C:513:GLN:HB2	1:C:538:LEU:HD11	2.04	0.40
1:C:326:THR:HG23	1:C:327:LEU:H	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	421/423 (100%)	398 (94%)	22 (5%)	1 (0%)	44 52
1	B	412/423 (97%)	399 (97%)	13 (3%)	0	100 100
1	C	413/423 (98%)	397 (96%)	16 (4%)	0	100 100
1	D	419/423 (99%)	399 (95%)	20 (5%)	0	100 100
All	All	1665/1692 (98%)	1593 (96%)	71 (4%)	1 (0%)	48 57

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	353	VAL

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	378/378 (100%)	362 (96%)	16 (4%)	25 33
1	B	372/378 (98%)	356 (96%)	16 (4%)	25 32
1	C	373/378 (99%)	356 (95%)	17 (5%)	23 30
1	D	376/378 (100%)	357 (95%)	19 (5%)	20 25
All	All	1499/1512 (99%)	1431 (96%)	68 (4%)	23 30

All (68) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	324	LYS
1	A	325	SER
1	A	326	THR
1	A	333	GLU
1	A	349	ARG
1	A	373	SER
1	A	427	SER
1	A	491	LYS
1	A	528	LEU
1	A	560	LYS

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Mol	Chain	Res	Type
1	A	607	SER
1	A	614	GLU
1	A	653	ILE
1	A	706[A]	THR
1	A	706[B]	THR
1	A	720	VAL
1	B	324	LYS
1	B	325	SER
1	B	326	THR
1	B	333	GLU
1	B	341	MET
1	B	365	GLU
1	B	369	GLN
1	B	376	ARG
1	B	469	GLN
1	B	505	GLN
1	B	516	LYS
1	B	528	LEU
1	B	557	GLU
1	B	575	MET
1	B	720	VAL
1	B	724	VAL
1	C	314	GLU
1	C	325	SER
1	C	333	GLU
1	C	353	VAL
1	C	428	LYS
1	C	457	LYS
1	C	485	ILE
1	C	491	LYS
1	C	528	LEU
1	C	555	LYS
1	C	557	GLU
1	C	575	MET
1	C	624	ARG
1	C	672	ARG
1	C	704	ARG
1	C	723	LEU
1	C	724	VAL
1	D	305	PHE
1	D	325	SER
1	D	326	THR

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Mol	Chain	Res	Type
1	D	341	MET
1	D	373	SER
1	D	375	LYS
1	D	383	MET
1	D	391	LYS
1	D	397	SER
1	D	491	LYS
1	D	512	GLN
1	D	528	LEU
1	D	560	LYS
1	D	607	SER
1	D	610	ASN
1	D	650	LYS
1	D	658	SER
1	D	720	VAL
1	D	722	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	345	GLN
1	A	358	GLN
1	A	412	HIS
1	A	512	GLN
1	A	719	HIS
1	B	322	HIS
1	B	369	GLN
1	B	412	HIS
1	B	492	GLN
1	C	412	HIS
1	C	441	HIS
1	D	412	HIS
1	D	513	GLN
1	D	610	ASN
1	D	719	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 20 ligands modelled in this entry, 2 are monoatomic - leaving 18 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
5	GOL	C	804	-	5,5,5	0.38	0	5,5,5	0.35	0
2	HEM	A	801	1	42,50,50	1.51	8 (19%)	46,82,82	1.74	12 (26%)
5	GOL	B	803	-	5,5,5	0.30	0	5,5,5	0.40	0
3	H4B	A	806	-	16,18,18	0.73	0	14,26,26	2.19	4 (28%)
4	A1CN5	B	802	-	24,26,26	0.53	0	29,36,36	1.41	2 (6%)
3	H4B	A	802	-	16,18,18	0.76	0	14,26,26	2.24	6 (42%)
2	HEM	D	802	1	42,50,50	1.54	6 (14%)	46,82,82	1.64	8 (17%)
3	H4B	C	802	-	16,18,18	0.81	0	14,26,26	2.28	5 (35%)
3	H4B	C	806	-	16,18,18	0.81	0	14,26,26	2.32	5 (35%)
4	A1CN5	A	803	-	24,26,26	0.52	0	29,36,36	1.67	7 (24%)
4	A1CN5	C	803	-	24,26,26	0.54	0	29,36,36	1.22	2 (6%)
5	GOL	A	804	-	5,5,5	0.32	0	5,5,5	0.43	0
5	GOL	D	804	-	5,5,5	0.41	0	5,5,5	0.30	0
5	GOL	C	805	-	5,5,5	0.33	0	5,5,5	0.37	0
4	A1CN5	D	803	-	24,26,26	0.47	0	29,36,36	1.75	5 (17%)
2	HEM	B	801	1	42,50,50	1.45	7 (16%)	46,82,82	1.48	6 (13%)
2	HEM	C	801	1	42,50,50	1.47	5 (11%)	46,82,82	1.66	10 (21%)
5	GOL	A	807	-	5,5,5	0.43	0	5,5,5	0.28	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	GOL	C	804	-	-	1/4/4/4	-
2	HEM	A	801	1	-	6/12/54/54	-
5	GOL	B	803	-	-	1/4/4/4	-
3	H4B	A	806	-	-	0/8/17/17	0/2/2/2
4	A1CN5	B	802	-	-	3/8/16/16	0/3/3/3
3	H4B	A	802	-	-	2/8/17/17	0/2/2/2
2	HEM	D	802	1	-	5/12/54/54	-
3	H4B	C	802	-	-	0/8/17/17	0/2/2/2
3	H4B	C	806	-	-	0/8/17/17	0/2/2/2
4	A1CN5	A	803	-	-	4/8/16/16	0/3/3/3
4	A1CN5	C	803	-	-	2/8/16/16	0/3/3/3
5	GOL	A	804	-	-	2/4/4/4	-
5	GOL	D	804	-	-	2/4/4/4	-
5	GOL	C	805	-	-	2/4/4/4	-
4	A1CN5	D	803	-	-	3/8/16/16	0/3/3/3
2	HEM	B	801	1	-	6/12/54/54	-
2	HEM	C	801	1	-	4/12/54/54	-
5	GOL	A	807	-	-	0/4/4/4	-

All (26) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	801	HEM	C3C-C2C	-4.26	1.34	1.40
2	B	801	HEM	C3C-C2C	-3.98	1.35	1.40
2	A	801	HEM	C3C-C2C	-3.89	1.35	1.40
2	D	802	HEM	C3C-C2C	-3.69	1.35	1.40
2	D	802	HEM	C3C-CAC	3.58	1.55	1.47
2	B	801	HEM	CAB-C3B	3.42	1.56	1.47
2	A	801	HEM	C3C-CAC	3.31	1.55	1.47
2	C	801	HEM	C3C-C4C	3.26	1.46	1.41
2	D	802	HEM	C3C-C4C	3.26	1.46	1.41
2	C	801	HEM	CAB-C3B	3.26	1.56	1.47
2	C	801	HEM	C3C-CAC	3.22	1.54	1.47
2	B	801	HEM	C3C-CAC	3.00	1.54	1.47
2	A	801	HEM	CAB-C3B	2.99	1.55	1.47
2	D	802	HEM	CAB-C3B	2.92	1.55	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	801	HEM	C3C-C4C	2.85	1.45	1.41
2	B	801	HEM	C3C-C4C	2.52	1.45	1.41
2	B	801	HEM	CMD-C2D	2.47	1.55	1.50
2	A	801	HEM	CMD-C2D	2.45	1.55	1.50
2	B	801	HEM	FE-NB	2.22	2.10	1.98
2	A	801	HEM	CMB-C2B	2.19	1.55	1.50
2	D	802	HEM	CMD-C2D	2.13	1.55	1.50
2	A	801	HEM	CAD-C3D	2.11	1.56	1.51
2	C	801	HEM	CMD-C2D	2.09	1.55	1.50
2	D	802	HEM	CAD-C3D	2.07	1.56	1.51
2	A	801	HEM	CHB-C1B	2.02	1.39	1.34
2	B	801	HEM	CMB-C2B	2.02	1.54	1.50

All (72) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	803	A1CN5	C02-N01-C06	5.99	122.55	118.07
3	C	802	H4B	C8A-C4A-C4	5.69	119.67	114.50
4	B	802	A1CN5	C02-N01-C06	5.65	122.30	118.07
3	A	802	H4B	C8A-C4A-C4	5.22	119.25	114.50
3	C	806	H4B	C8A-C4A-C4	5.13	119.17	114.50
3	A	806	H4B	C8A-C4A-C4	5.11	119.15	114.50
4	C	803	A1CN5	C02-N01-C06	4.91	121.74	118.07
2	A	801	HEM	C4B-CHC-C1C	4.58	128.60	122.56
2	B	801	HEM	C4B-CHC-C1C	3.96	127.79	122.56
2	D	802	HEM	C4B-CHC-C1C	3.91	127.72	122.56
4	A	803	A1CN5	C08-C06-N01	3.77	123.28	115.69
2	C	801	HEM	C4B-CHC-C1C	3.62	127.33	122.56
3	C	806	H4B	N1-C2-N3	-3.61	119.95	125.48
2	A	801	HEM	C3B-C2B-C1B	3.45	109.00	106.41
3	C	806	H4B	C2-N3-C4	3.44	120.75	115.96
2	A	801	HEM	C3B-C4B-NB	-3.40	107.03	109.47
2	C	801	HEM	C3B-C2B-C1B	3.38	108.95	106.41
4	A	803	A1CN5	C02-N01-C06	3.32	120.55	118.07
3	A	806	H4B	C2-N3-C4	3.28	120.52	115.96
2	D	802	HEM	C4C-CHD-C1D	3.26	126.86	122.56
3	A	802	H4B	N1-C2-N3	-3.24	120.51	125.48
4	A	803	A1CN5	C08-C06-C05	-3.02	116.80	121.30
3	C	802	H4B	N1-C2-N3	-3.01	120.88	125.48
2	A	801	HEM	C1B-NB-C4B	2.99	108.75	105.21
2	C	801	HEM	CAD-C3D-C4D	-2.99	119.49	124.70
3	A	806	H4B	N1-C2-N3	-2.98	120.91	125.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	802	HEM	CBA-CAA-C2A	-2.96	107.56	112.54
2	C	801	HEM	CAD-C3D-C2D	2.95	133.40	127.87
2	B	801	HEM	CMC-C2C-C3C	2.94	130.57	124.68
3	C	802	H4B	C2-N3-C4	2.94	120.05	115.96
2	D	802	HEM	C3B-C2B-C1B	2.92	108.61	106.41
4	A	803	A1CN5	N02-C02-N01	2.91	121.27	116.59
3	C	806	H4B	N2-C2-N3	2.87	121.53	117.22
3	A	802	H4B	C2-N3-C4	2.84	119.91	115.96
2	D	802	HEM	C3B-C4B-NB	-2.83	107.43	109.47
4	B	802	A1CN5	C05-C06-N01	-2.83	119.51	122.73
2	C	801	HEM	CMC-C2C-C3C	2.79	130.25	124.68
4	D	803	A1CN5	C08-O09-C11	2.79	123.27	117.76
4	D	803	A1CN5	C08-C06-N01	2.77	121.27	115.69
3	A	802	H4B	C2-N1-C8A	2.73	121.09	114.59
2	A	801	HEM	C4C-CHD-C1D	2.70	126.13	122.56
2	B	801	HEM	C3B-C2B-C1B	2.70	108.44	106.41
2	C	801	HEM	CMD-C2D-C1D	-2.68	120.85	125.03
4	D	803	A1CN5	C05-C06-N01	-2.65	119.71	122.73
4	A	803	A1CN5	O09-C11-C12	2.62	119.87	115.92
3	C	806	H4B	C2-N1-C8A	2.59	120.75	114.59
2	C	801	HEM	CHB-C1B-NB	2.58	127.57	124.37
2	D	802	HEM	CMD-C2D-C1D	-2.57	121.02	125.03
2	B	801	HEM	CHA-C4D-ND	2.57	127.56	124.37
4	A	803	A1CN5	C05-C06-N01	-2.47	119.91	122.73
3	C	802	H4B	C2-N1-C8A	2.42	120.34	114.59
4	A	803	A1CN5	C08-O09-C11	2.37	122.45	117.76
3	A	802	H4B	N2-C2-N3	2.36	120.76	117.22
2	A	801	HEM	C2B-C1B-NB	-2.36	107.13	109.84
2	C	801	HEM	C4C-CHD-C1D	2.35	125.65	122.56
2	D	802	HEM	C1B-NB-C4B	2.33	107.97	105.21
2	C	801	HEM	CHD-C1D-ND	2.28	126.89	124.44
3	A	806	H4B	C2-N1-C8A	2.26	119.97	114.59
2	A	801	HEM	CAD-C3D-C2D	2.23	132.04	127.87
2	C	801	HEM	CHA-C4D-ND	2.22	127.13	124.37
2	A	801	HEM	CMA-C3A-C4A	-2.18	125.26	128.46
2	A	801	HEM	CAD-C3D-C4D	-2.17	120.91	124.70
2	A	801	HEM	CHD-C1D-ND	2.16	126.75	124.44
3	C	802	H4B	C11-C10-C9	-2.14	109.50	112.11
4	D	803	A1CN5	O09-C11-C12	2.14	119.14	115.92
2	A	801	HEM	CHA-C4D-ND	2.12	127.00	124.37
2	D	802	HEM	C4A-C3A-C2A	2.12	108.47	107.00
2	A	801	HEM	CMD-C2D-C1D	-2.09	121.76	125.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A	802	H4B	C4-C4A-N5	2.08	121.54	118.57
2	B	801	HEM	C4A-C3A-C2A	2.04	108.41	107.00
2	B	801	HEM	CAD-CBD-CGD	-2.01	108.32	113.67
4	C	803	A1CN5	C05-C06-N01	-2.00	120.45	122.73

There are no chirality outliers.

All (43) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	801	HEM	C4D-C3D-CAD-CBD
2	B	801	HEM	C2A-CAA-CBA-CGA
2	B	801	HEM	C2D-C3D-CAD-CBD
2	B	801	HEM	C4D-C3D-CAD-CBD
2	C	801	HEM	C2D-C3D-CAD-CBD
4	A	803	A1CN5	C12-C11-O09-C08
2	D	802	HEM	C2D-C3D-CAD-CBD
2	C	801	HEM	C4D-C3D-CAD-CBD
2	D	802	HEM	C4D-C3D-CAD-CBD
2	A	801	HEM	C2D-C3D-CAD-CBD
2	A	801	HEM	C2A-CAA-CBA-CGA
2	C	801	HEM	C2A-CAA-CBA-CGA
2	D	802	HEM	C2A-CAA-CBA-CGA
5	A	804	GOL	O1-C1-C2-O2
5	A	804	GOL	O1-C1-C2-C3
5	C	805	GOL	O1-C1-C2-C3
5	D	804	GOL	O1-C1-C2-C3
5	D	804	GOL	O1-C1-C2-O2
4	B	802	A1CN5	C14-C15-C17-C18
4	B	802	A1CN5	C16-C15-C17-C18
5	B	803	GOL	O1-C1-C2-O2
4	D	803	A1CN5	C14-C15-C17-C18
4	C	803	A1CN5	C14-C15-C17-C18
4	D	803	A1CN5	C16-C15-C17-C18
4	C	803	A1CN5	C16-C15-C17-C18
5	C	804	GOL	O2-C2-C3-O3
5	C	805	GOL	O1-C1-C2-O2
4	B	802	A1CN5	C12-C11-O09-C08
2	A	801	HEM	C4B-C3B-CAB-CBB
2	B	801	HEM	C4B-C3B-CAB-CBB
2	C	801	HEM	C4B-C3B-CAB-CBB
2	D	802	HEM	C4B-C3B-CAB-CBB
4	A	803	A1CN5	C14-C15-C17-C18

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Mol	Chain	Res	Type	Atoms
4	A	803	A1CN5	C16-C15-C17-C18
2	B	801	HEM	CAD-CBD-CGD-O2D
4	D	803	A1CN5	C15-C17-C18-N21
3	A	802	H4B	N5-C6-C9-O9
2	D	802	HEM	CAD-CBD-CGD-O1D
3	A	802	H4B	C7-C6-C9-O9
4	A	803	A1CN5	C16-C11-O09-C08
2	A	801	HEM	CAD-CBD-CGD-O2D
2	B	801	HEM	CAD-CBD-CGD-O1D
2	A	801	HEM	CAD-CBD-CGD-O1D

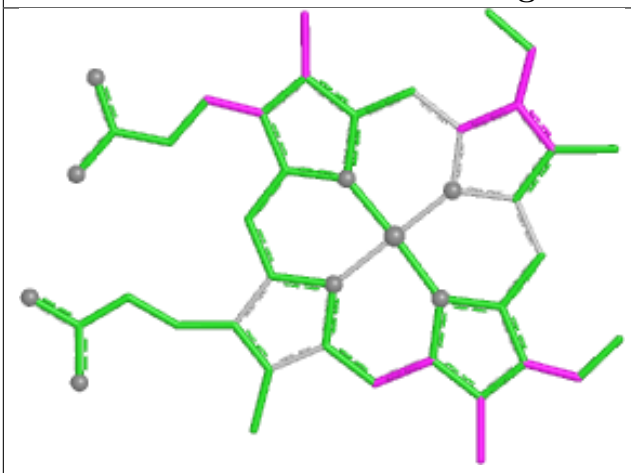
There are no ring outliers.

10 monomers are involved in 21 short contacts:

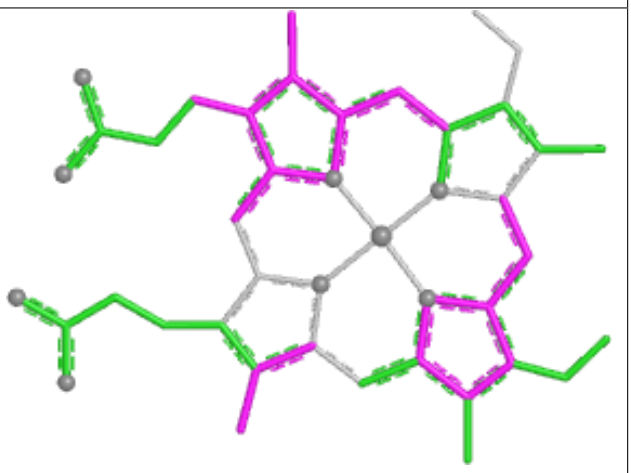
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	801	HEM	5	0
2	D	802	HEM	2	0
3	C	802	H4B	1	0
4	C	803	A1CN5	1	0
5	A	804	GOL	1	0
5	C	805	GOL	1	0
4	D	803	A1CN5	1	0
2	B	801	HEM	4	0
2	C	801	HEM	4	0
5	A	807	GOL	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

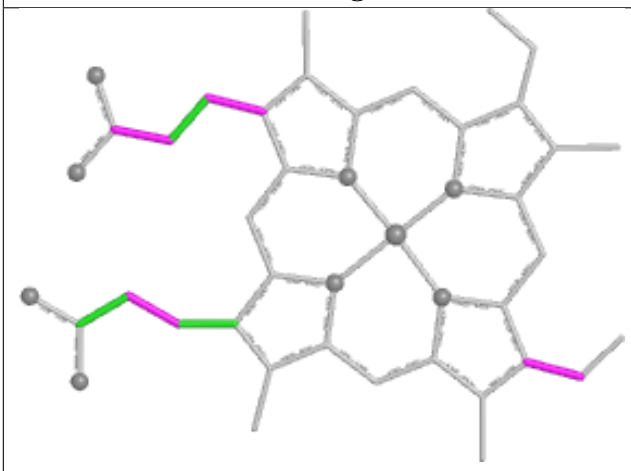
Ligand HEM A 801



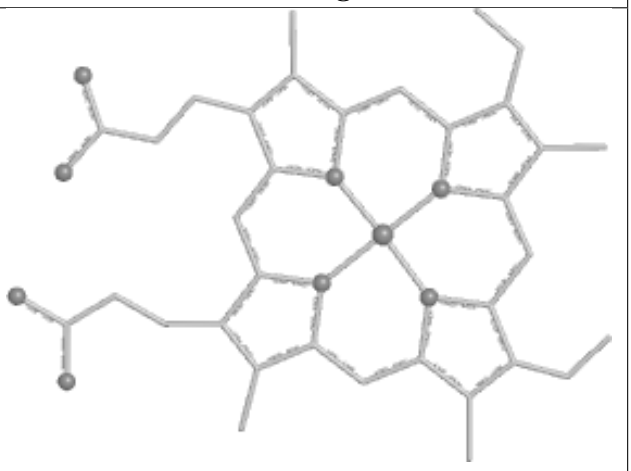
Bond lengths



Bond angles

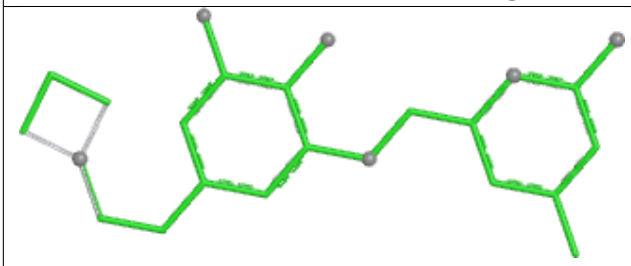


Torsions



Rings

Ligand A1CN5 B 802



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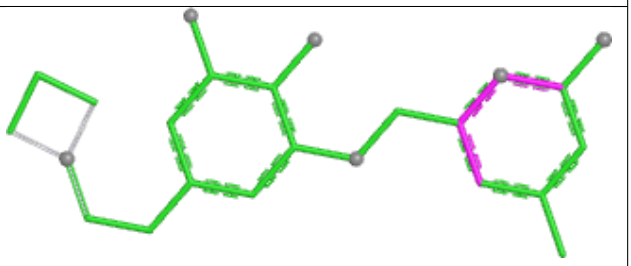
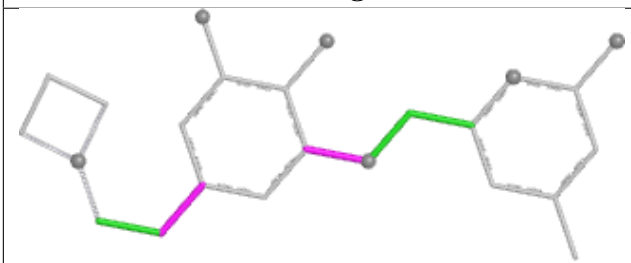


Bond angles



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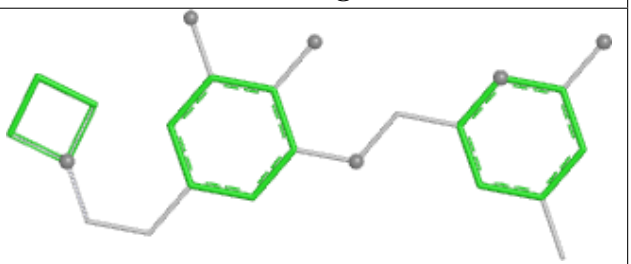
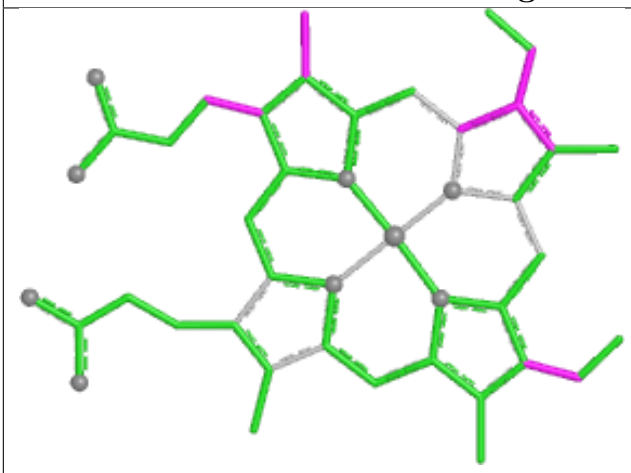


Rings

Ligand HEM D 802



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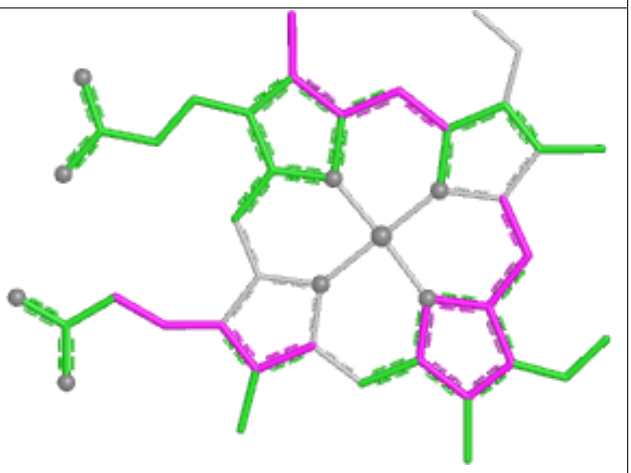
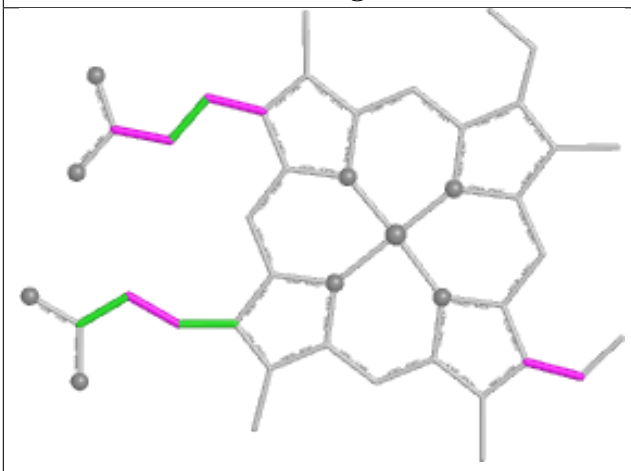


Bond angles



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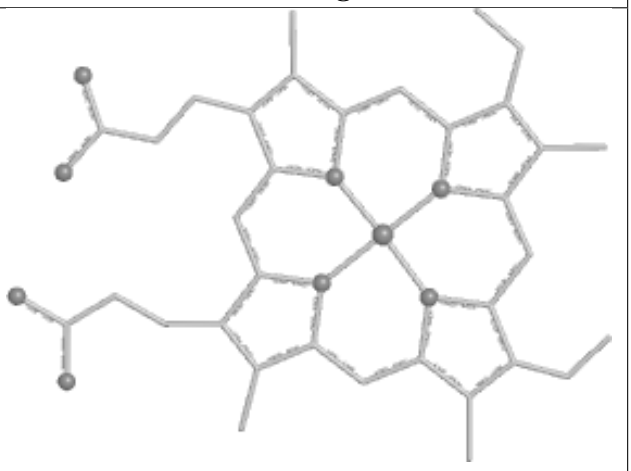
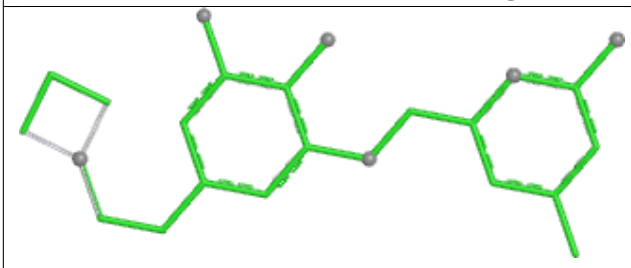
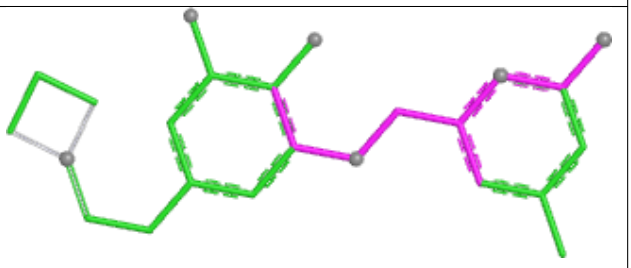


Rings

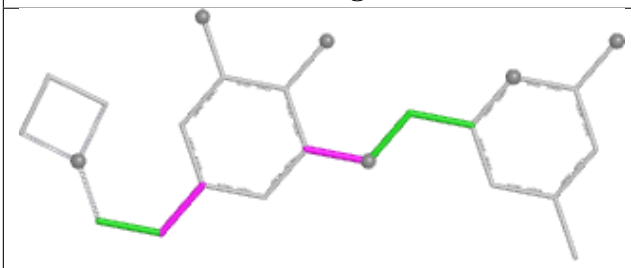
Ligand A1CN5 A 803



Bond lengths



Bond angles



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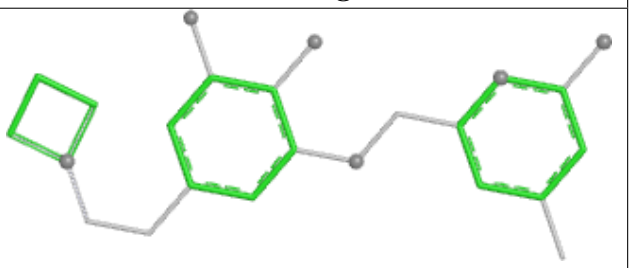
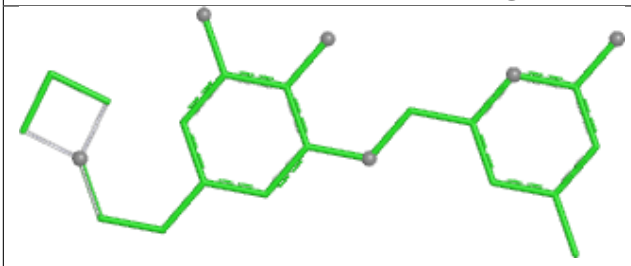
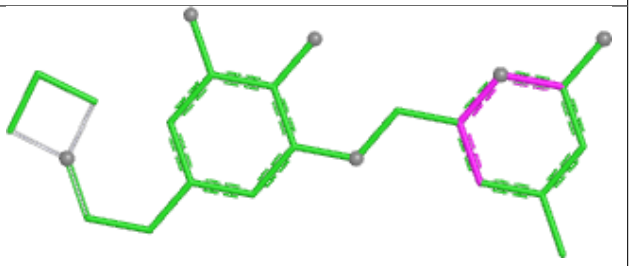
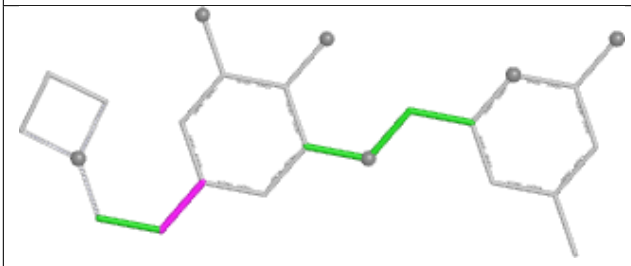
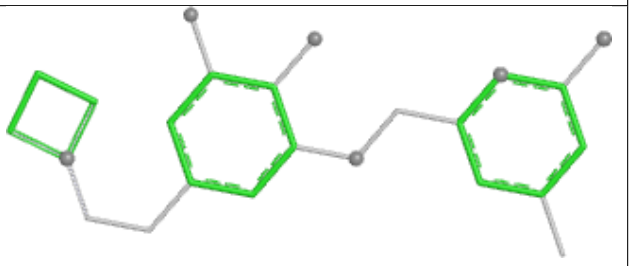


Rings

Ligand A1CN5 C 803	
 Bond lengths	 Bond angles
 Torsions	 Rings

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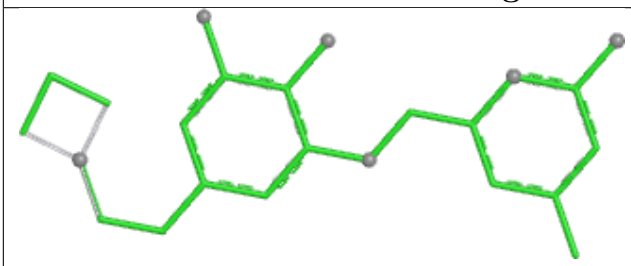
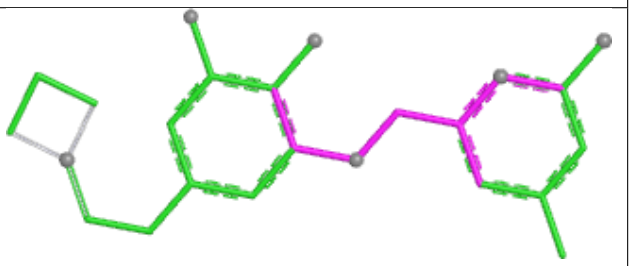
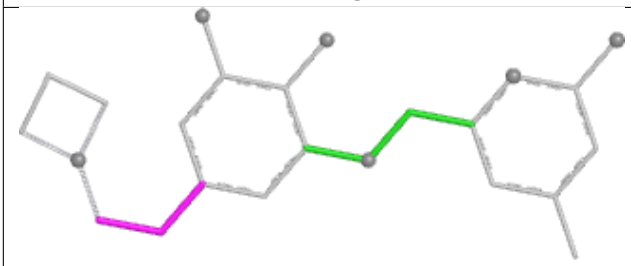
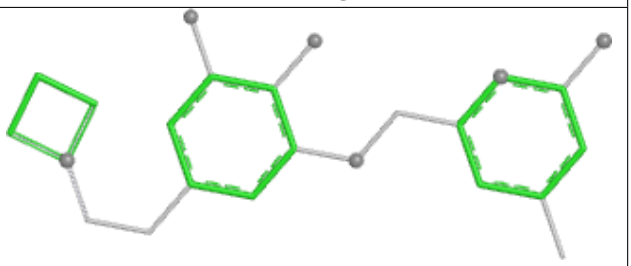
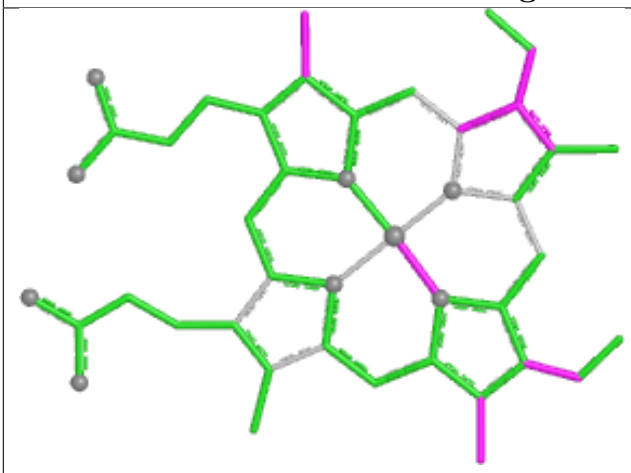
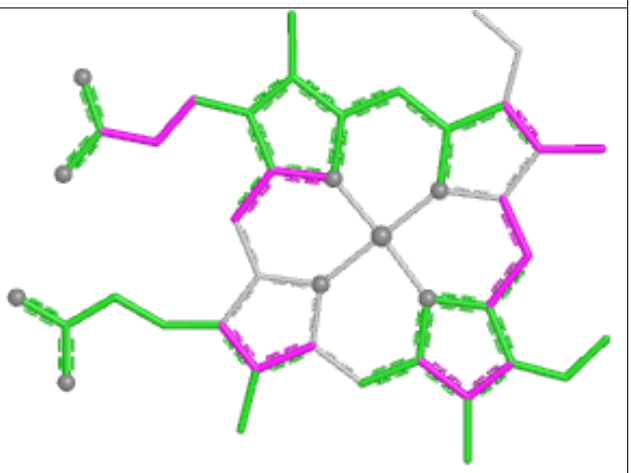
 Bond lengths	 Bond angles
 Torsions	 Rings

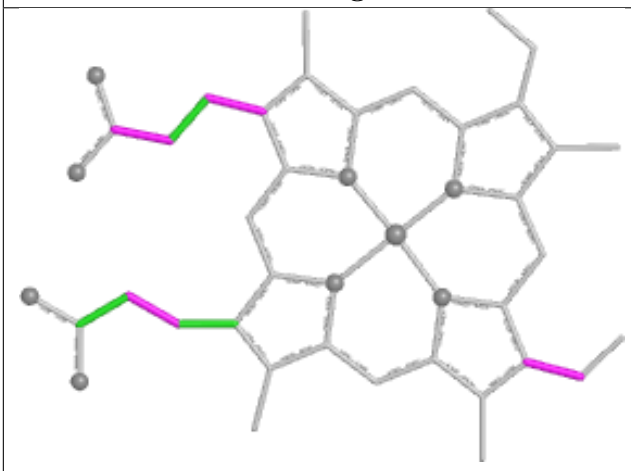
Ligand HEM B 801



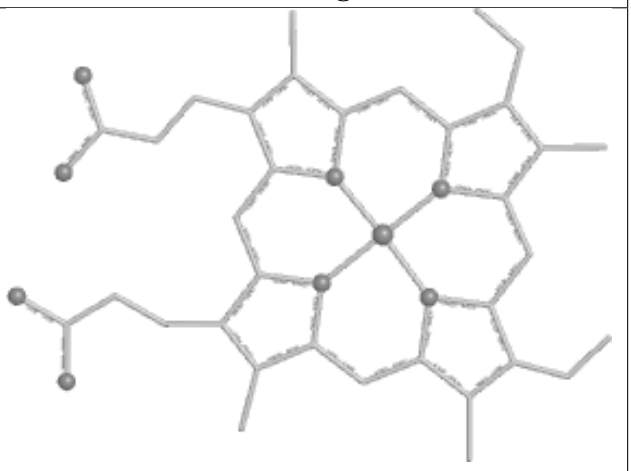
Bond lengths



Bond angles

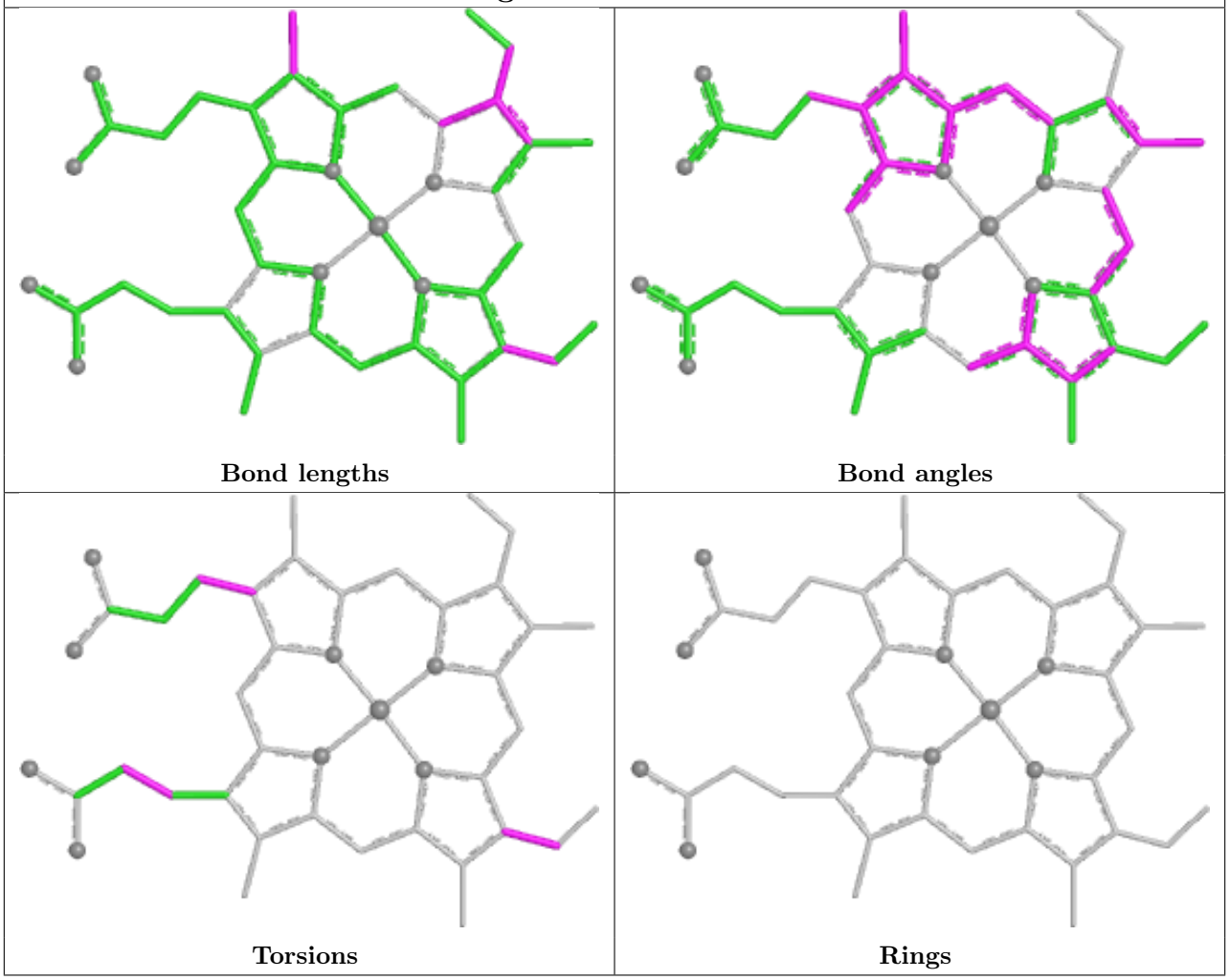


Torsions



Rings

Ligand HEM C 801



5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	418/423 (98%)	-1.22	0	100	100	25, 57, 96, 146	5 (1%)
1	B	414/423 (97%)	-1.27	0	100	100	27, 52, 84, 118	2 (0%)
1	C	412/423 (97%)	-1.29	0	100	100	26, 51, 84, 109	5 (1%)
1	D	418/423 (98%)	-1.22	0	100	100	29, 57, 96, 148	3 (0%)
All	All	1662/1692 (98%)	-1.25	0	100	100	25, 54, 92, 148	15 (0%)

There are no RSRZ outliers to report.

6.2 Non-standard residues in protein, DNA, RNA chains

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates

There are no oligosaccharides in this entry.

6.4 Ligands

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	GOL	C	804	6/6	0.97	0.07	78,79,81,84	0
4	A1CN5	B	802	24/24	0.98	0.08	38,69,110,111	0
4	A1CN5	C	803	24/24	0.98	0.08	38,62,98,100	0
4	A1CN5	D	803	24/24	0.98	0.08	38,81,100,101	0

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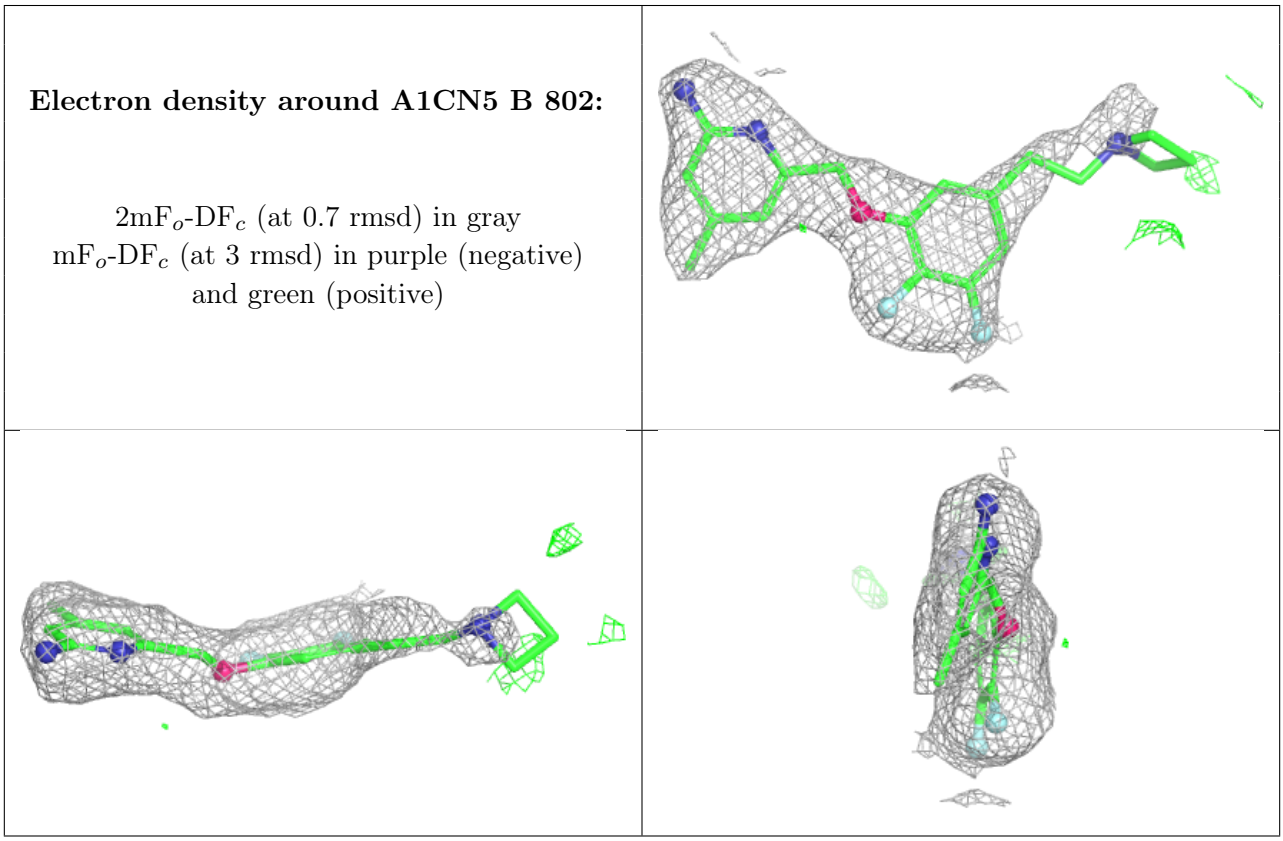
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	GOL	B	803	6/6	0.98	0.07	64,68,69,70	0
4	A1CN5	A	803	24/24	0.98	0.08	35,84,102,106	0
5	GOL	C	805	6/6	0.98	0.05	53,55,63,63	0
5	GOL	D	804	6/6	0.98	0.05	59,63,71,79	0
3	H4B	C	802	17/17	0.99	0.04	45,71,77,79	0
5	GOL	A	804	6/6	0.99	0.04	52,66,70,72	0
5	GOL	A	807	6/6	0.99	0.05	72,78,82,85	0
3	H4B	C	806	17/17	0.99	0.04	63,71,78,85	0
2	HEM	B	801	43/43	0.99	0.04	25,44,64,73	0
3	H4B	A	802	17/17	0.99	0.05	56,70,78,80	0
3	H4B	A	806	17/17	0.99	0.05	54,66,75,76	0
2	HEM	D	802	43/43	1.00	0.04	31,49,66,74	0
2	HEM	A	801	43/43	1.00	0.03	33,49,66,73	0
2	HEM	C	801	43/43	1.00	0.04	34,44,64,68	0
6	ZN	A	805	1/1	1.00	0.01	48,48,48,48	0
6	ZN	D	801	1/1	1.00	0.01	48,48,48,48	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

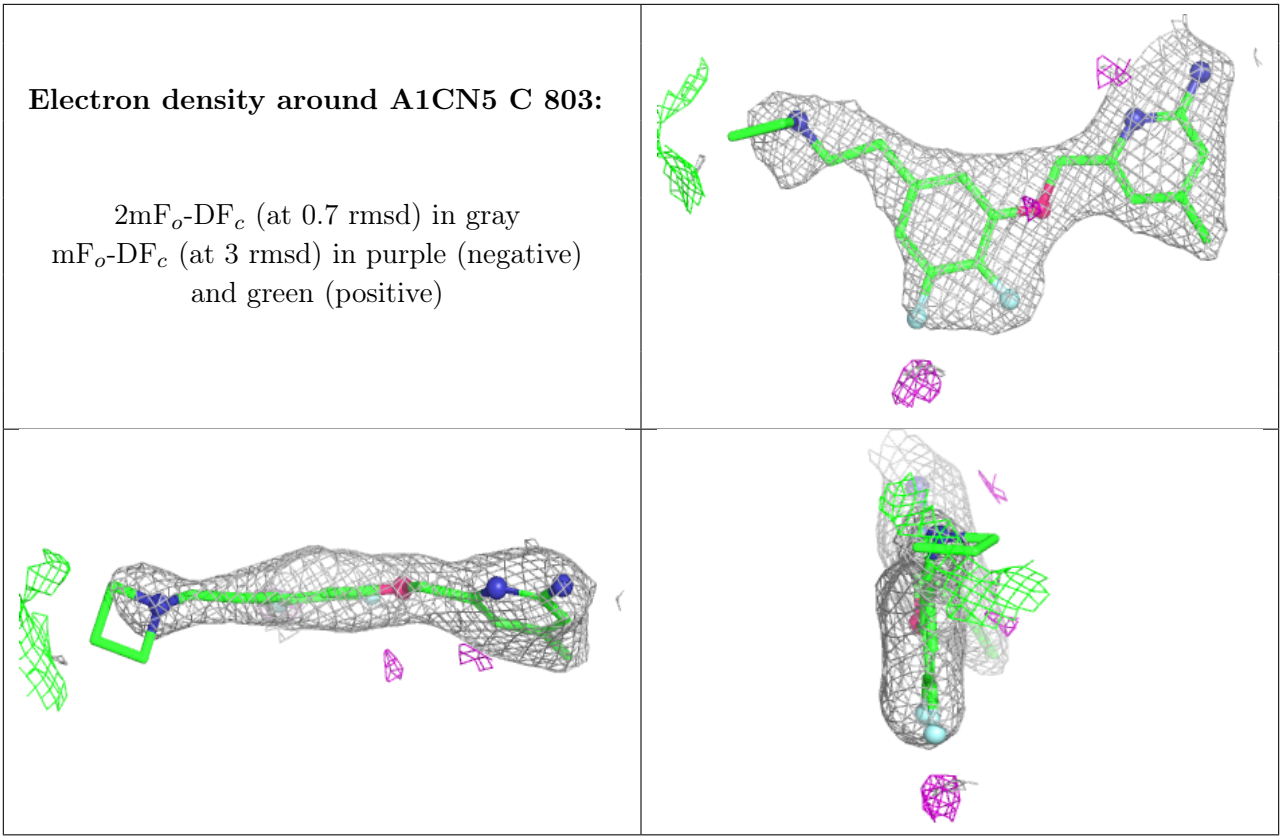
Electron density around A1CN5 B 802:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around A1CN5 C 803:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around A1CN5 D 803:

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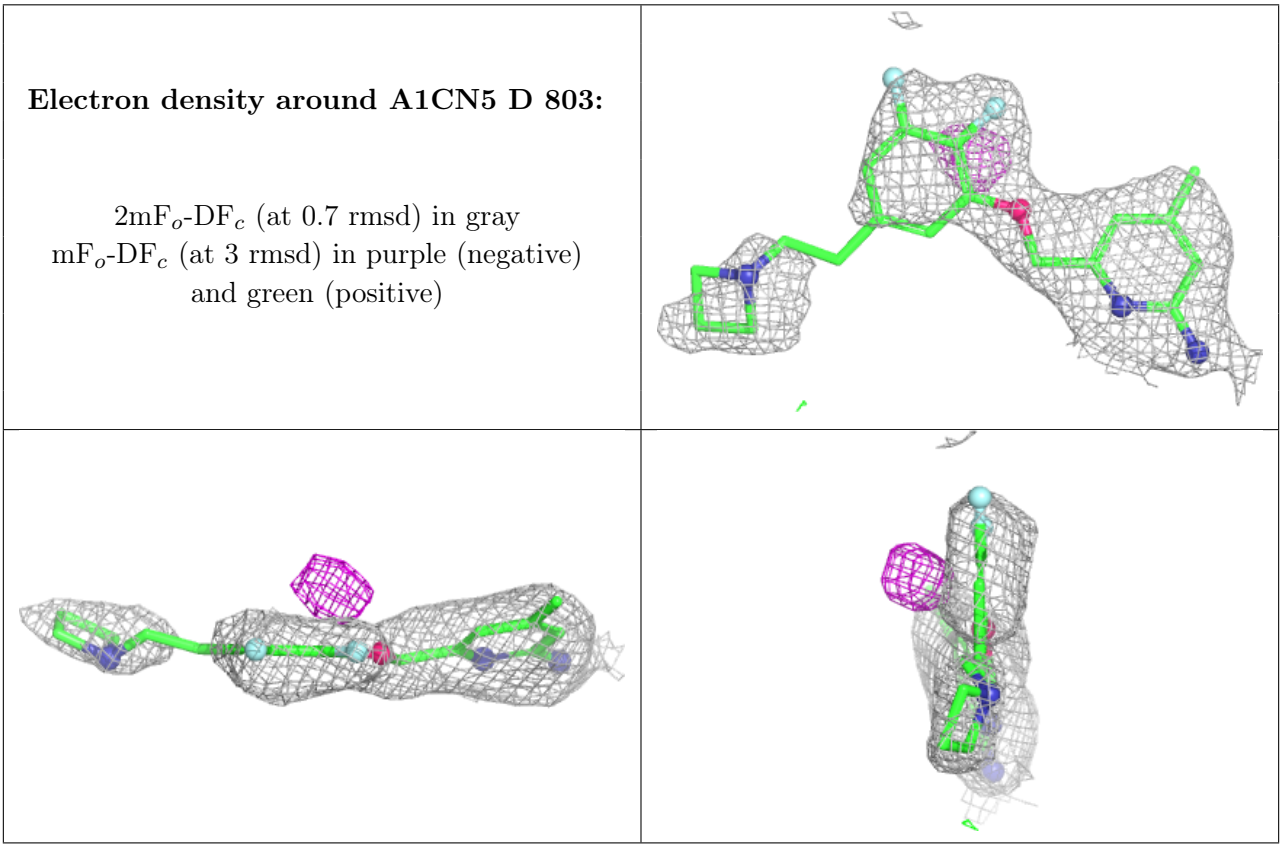
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around A1CN5 A 803:

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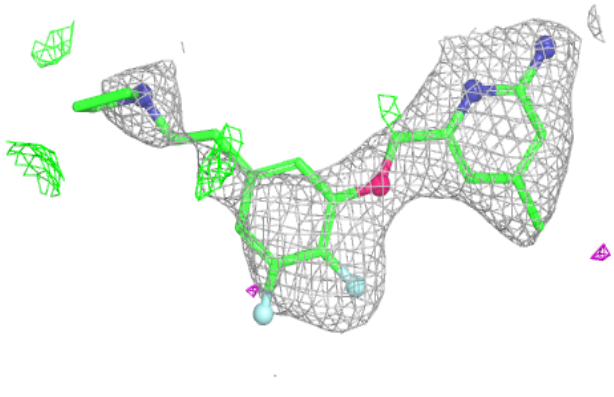
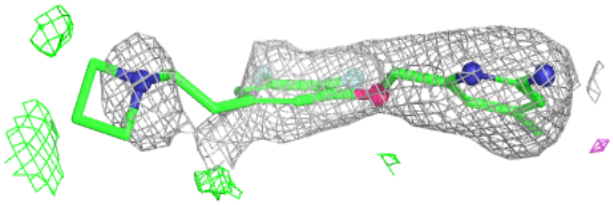
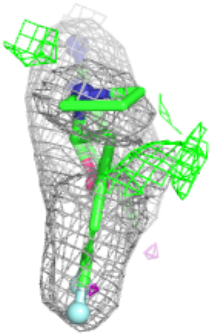
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

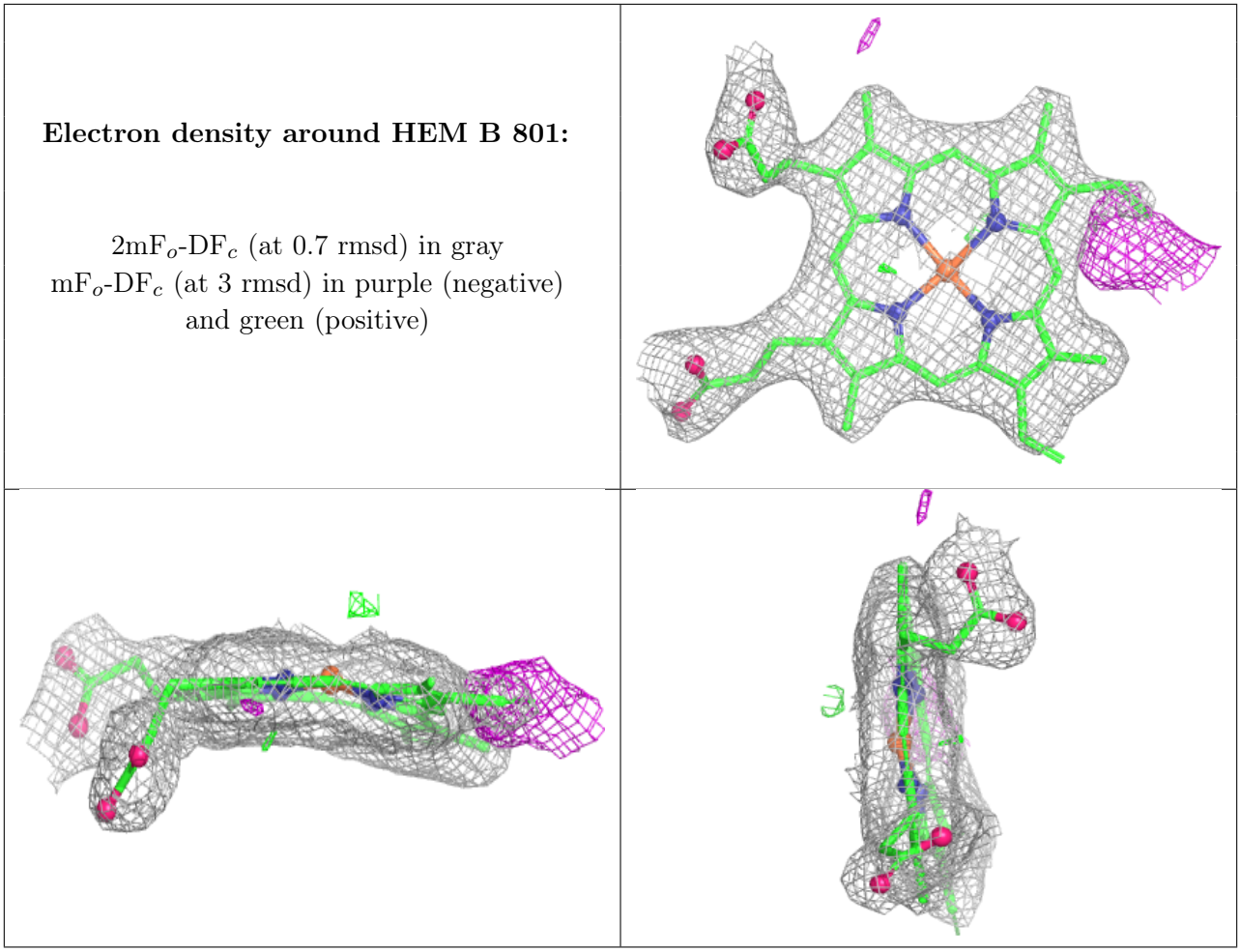






Electron density around HEM B 801:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around HEM D 802:

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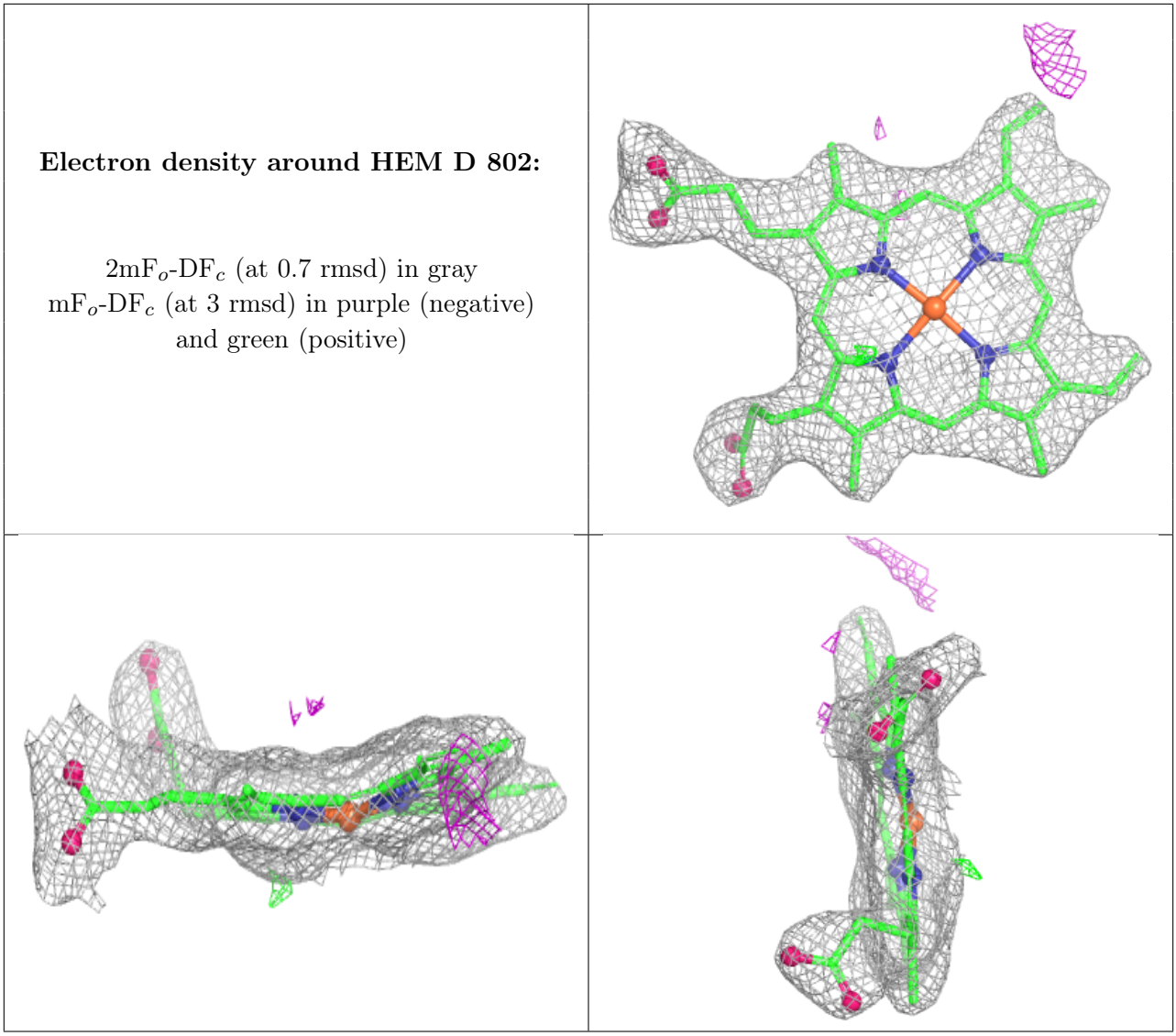
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around HEM A 801:

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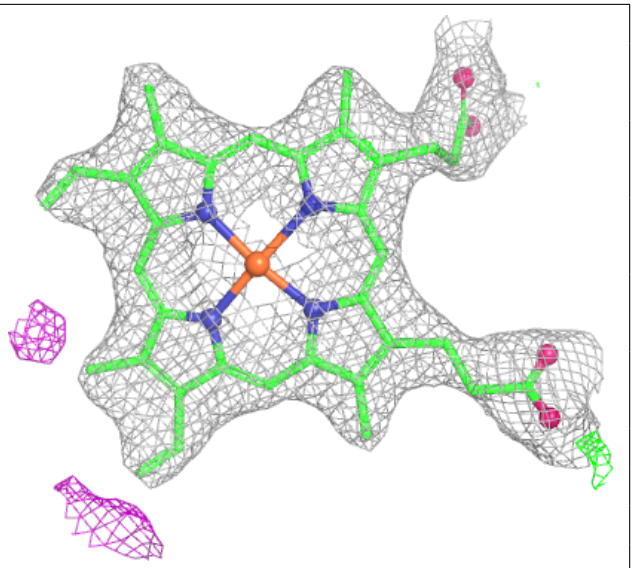
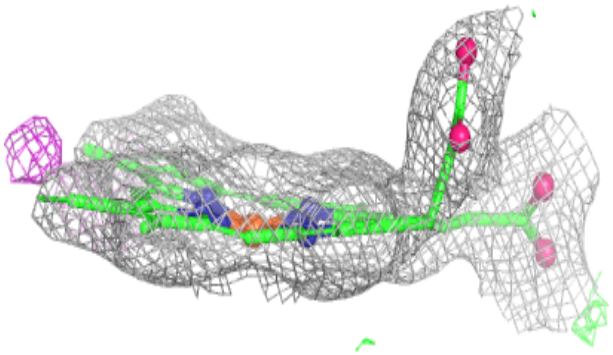
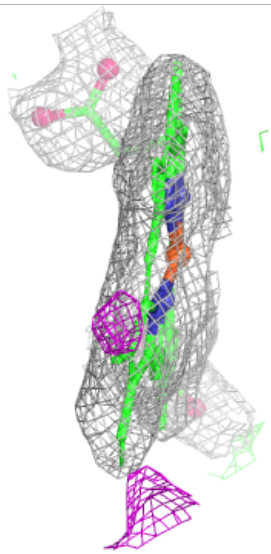
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

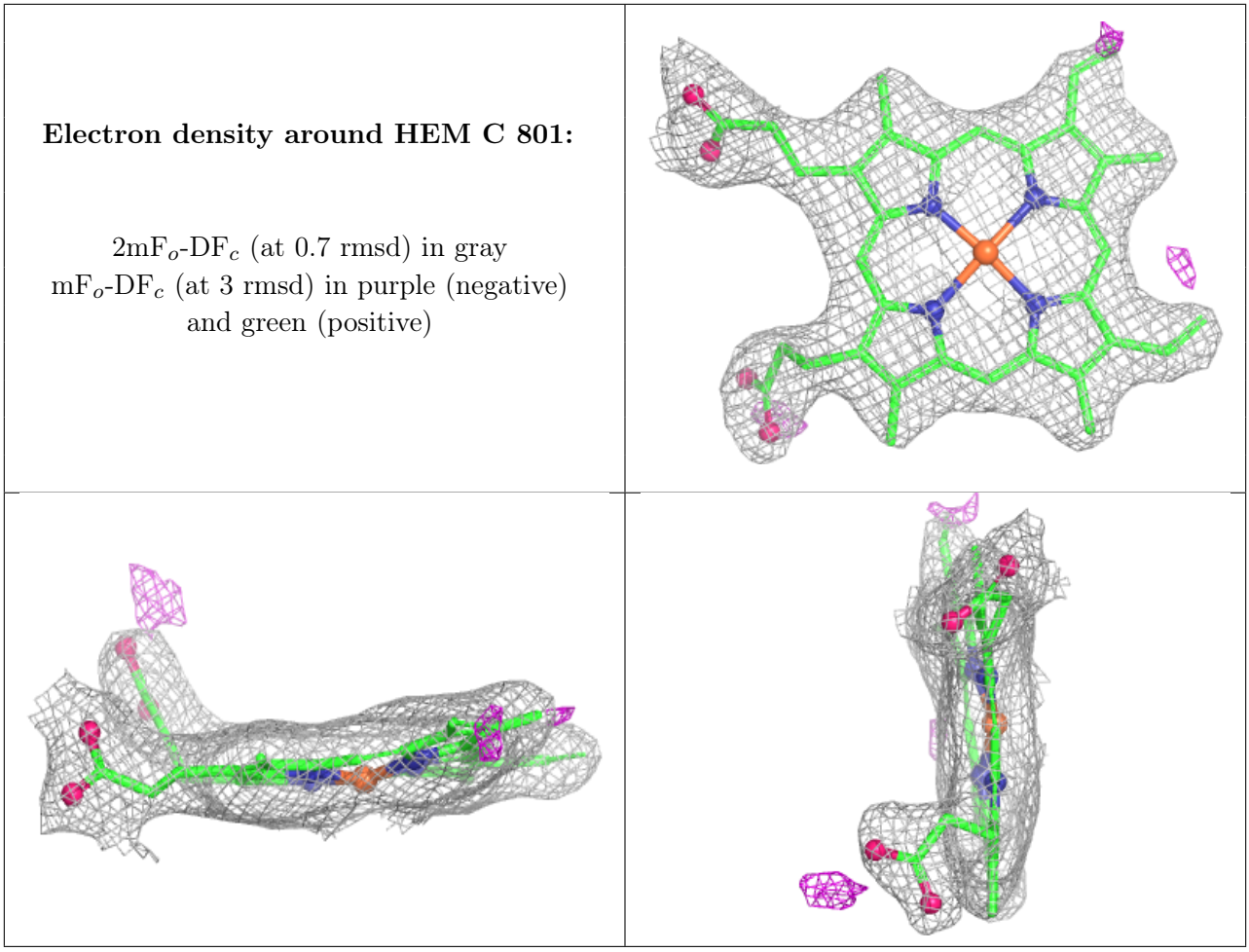






Electron density around HEM C 801:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers

There are no such residues in this entry.